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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,879	02/22/2002	Jean-Luc Truche	10020005-1	9366

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AGILENT TECHNOLOGIES, INC.
Legal Department, DL429
Intellectual Property Administration
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EXAMINER

SOUW, BERNARD E

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/080,879

Applicant(s)

TRUCHE ET AL.

Examiner

Bernard E. Souw

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 and 49-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-47 and 49-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 18 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☒ Interview Summary (PTO-413) Paper No(s). 8.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Communication

1. The previous Office Action, paper no.7, mailed 06/18/2003, is withdrawn in view of this revised action.

Amendment

2. The Amendment A, Paper No. 6/a, filed on 03/28/2003, has been entered. The present Office Action is made with all the suggested amendments being fully considered.

Drawings

3. The amended specification regarding Fig.7 on pg.11, 4th paragraph, as amended per Amendment A, paper no.6, pg.2/lines 3-10 from bottom, i.e., denoting Fig.7 as an "**alternative device**" is now accepted, since Applicant is allowed to be his own lexicographer.

Specification

4. The previous Examiner's objections to the specification are now withdrawn. However, in the Specification, page 10/line 4, the Brief Description of Fig.7 incorrectly describes Fig.7 as a "prior art device". Correction is required.

§ 112 Rejections & Objections

5. The specific rejections and objections having been addressed by Applicant, the previous § 112 rejections and objections are now withdrawn.

New Ground(s) of Rejection

6. Applicant's arguments regarding the prior arts rejections have been considered but are moot in view of the new ground(s) of rejection.

Double Patenting

7. Claims 1-47, 49-56 and 58 of this application conflict with claims 1-64 of the copending Application No. 10/134,806 filed on 04/29/2002 by the same Applicant. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Statutory Type Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467,

114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

8. Claims 11-17 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 15-21, respectively, of copending Application No. 10/134,806. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

9. Claims 19-35 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 22-38, respectively, of copending Application No. 10/134,806. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

10. Claims 39-47 and 49-51 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 39-47 and 49-51, respectively, of copending Application No. 10/134,806. The limitations are effectively the same because of the words "*comprising*" commonly used in the claims. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

11. Claims 36-38 and 52-53 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 52-54 and 62-63, respectively, of copending Application No. 10/134,806. The limitations are effectively the same

because of the words "*comprising*" commonly used in the claims. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Obviousness Type Double Patenting – No Secondary Reference(s)

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Obviousness Type Double Patenting – No Secondary Reference(s)

12. Claims 1-10, 18, 54-56 and 58 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-7 and various claim combinations of copending Application No. 10/134,806 filed on 04/29/2002 by the same Applicant. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

► Claim 1 recites the same limitations as claim 1 of the copending Application, broadly interpreted as that the heat being provided by the ion source, e.g., by a laser

beam (delivered through a light *conduit* or optical capillary or optical fiber), or by flash desorption (provided by heated gas delivered through a gas capillary or *conduit*).

- ▶ Claims 2-5 recite the same limitations as claims 2-5 of the copending Application, respectively.
- ▶ Claim 6 recites the same limitation as claim 7 of the copending Application.
- ▶ Claim 7 recites the same limitation as claim 6 of the copending Application.
- ▶ Claims 8-10 recites limitations that are inherent to claim 3 of the copending Application, as generally known in the art in the case of FAB ion sources.
- ▶ Claim 18 recites the same limitations as a combination of claims 22 and 23 of the copending Application.
- ▶ Claim 54 recites the same limitations as a combination of claims 62 and 26 of the copending Application.
- ▶ Claim 55 recites the same limitations as a combination of claims 47 and 52 of the copending Application.
- ▶ Claim 56 recites the same limitations as a combination of claims 47, 52 and 29 of the copending Application.
- ▶ Claim 58 implicates the limitations of a combination of claims 47, 52 and 31 of the copending Application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 39-45, 47, and 49-52 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Verentchikov et al. (USPAT # 6,504,150).

Regarding independent claims 39 and 47 (having identical limitations that differ only slightly in their preambles) and method claim 52, Verentchikov et al. disclose an apparatus having mass analysis and detection capabilities, comprising:

(a) a matrix based ion source 11c (with target 13) for producing analyte ions, as shown in Fig.4A, as recited in Col.7/ll.32-34;

(b) an ion detector inherent in mass spectrometer/analyzer 44, downstream from the ion source 11c, for detecting enhanced analyte ions, as recited in Col.7/ll.45-55;

(c) an ion enhancement system 40 interposed between the ion source 11c (or 13) and the detector (MS) 44, for enhancing the analyte ions, as recited in Col.7/ll.33-39; and

(d) an ion transport system 42 adjacent to the ion enhancement system 40 for transporting the enhanced analyte ions from the ion enhancement system 40 to the ion detector (MS) 44.

- ▶ Regarding claim 40, Verentchikov's ion detector is (an inherent part of) a mass spectrometer 44, as recited in Col.7/ll.45-48.
- ▶ Regarding claims 41 and 42, Verentchikov's ion enhancement system 46 shown in embodiment Fig.4C comprises & encloses a portion of the ion transport system (RF-multipole guide 42 in Fig. 4A and 45 in Fig.4B), as recited in Col.8/ll.57-60, Col.7/ll.35-40 and Col.8/ll.30-36, whereby the enhancement effect (breaking up molecular clusters) is specifically recited in Col.8/ll.32-36. ***Note: the limitation of claims 41 and 42 does not recite any coaxial heat-exchange structure, and hence, is here interpreted in its broadest sense.***
- ▶ Regarding claim 43, Verentchikov's ion enhancement system 40 shown in embodiment Fig.4A comprises a portion of the ion source 11c, as recited in Col.7/ll. 32-36, whereby the enhancement effect (breaking up molecular clusters) is specifically recited in Col.7/ll.36-39.
- ▶ Regarding claims 44 and 49, Verentchikov's ion enhancement system 40 comprises one conduit, as recited in Col.7/ll.34-35.
- ▶ Regarding claims 45 and 50, Verentchikov's ion enhancement system 40 comprises one gas source connected to gas inlet port 21 in Fig.4A, B, C, which is equivalent to the same port 21 in Fig.2, as recited in Col.5/ll.10-20.
- ▶ Regarding claim 51, Verentchikov's ion enhancement system 40 is a collecting capillary, as shown in Fig.4A.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 46 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al.

► Regarding claims 46 and 51, Verentchikov's ion collecting capillary 40 can simultaneously serve as ion transport system to deliver enhanced ions to the mass sensitive detector 44, i.e., by eliminating RF quadrupole 42 from Fig.4A which is here not needed, since no large pressure differential is expected between the ion source chamber and the conventional unspecified mass analyzer here being used (in contrast to Verentchikov's Time-of-Flight mass analyzer that needs ultra-high vacuum because of its sensitivity to collisions with residual gas molecules), and hence, no differential pumping over a middle section through pumping port 48 is necessary.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to eliminate the RF quadrupole ion transport system 42 from the embodiment shown in Fig.4A, in case a short ion transit constrained by a compact spectrometer design is desired.

15. Claims 1-22, 25-27, 29-38, 53, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al. in view of Laiko et al. (Anal. Chem. 2000,

Vol.72, pp.5239 ff.), hereafter denoted by Laiko-II (IDS), and further by Willoughby (USPAT # 4,968,885), hereafter denoted as Willoughby-885.

Regarding claim 11, Verentchikov et al. disclose a mass spectrometer that produces enhanced analyte ions for ease of detection, comprising:

- (a) a matrix based ion source 11c (with target 13) for producing and discharging analyte ions to an ion region (between target 13 and collecting capillary 40), as shown in Fig.4A, as recited in Col.7/ll.32-34;
- (b) a collecting capillary 40 downstream from both matrix based ion source 13 and the ion region for receiving the analyte ions produced, as recited in Col.7/ll.32-48;
- (c) a gas source connected to gas inlet port 21 in Fig.4A, B, C, which is equivalent to the same port 21 in Fig.2, as recited in Col.5/ll.10-20;
- (d) a conduit for conducting the gas from the source towards the ion region between target 13 and collecting capillary 40, which is no other than inlet port 21 forming the end of the conduit, as is understood by one of ordinary skill in the art from the geometry shown in Fig.4A, and providing ion enhancement to the analyte ions in the ion region before entering the collecting capillary 40, again as understood by one of ordinary skill in the art from the geometry of Fig.4A; and
- (e) a detector inherent in mass spectrometer/analyzer 44, downstream from the collecting capillary 40 for detecting analyte ions received and enhanced by the collecting capillary 40, as recited in Col.7/ll.45-55;
- (f) an ion enhancement system 40 interposed between the ion source 11c (or 13) and the detector (MS) 44, for enhancing the analyte ions, as recited in Col.7/ll.33-39; and

(g) an ion transport system 42 adjacent to the ion enhancement system 40 for transporting the enhanced analyte ions from the ion enhancement system 40 to the ion detector (MS) 44.

However, the inlet gas conduit 21 does not extend to the region closest to the ion region between target 13 and collecting capillary 40, as can be seen in Verentchikov's Fig.1 and Fig.4A.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to design the end of the gas conduit, i.e., port 21 in Fig.4A, as near as possible to the ion region between target matrix 13 and collecting capillary 40, so the pulsed gas pressure synchronized with the laser pulse (in a particular embodiment) will *effectively drag* the ionized analytes towards the inlet opening of the collecting capillary 40, as taught by Verentchikov in Col. 4/II.44-48, Col.5/II.21-40 in reference to Fig.1, and more specifically in Col.7/II.32-55 in reference to Fig.4A with the mid-section 17c and RF quadrupole 42 eliminated, thus implicating that inlet tube 21 be designed as close as possible to the target matrix 13 and collecting capillary 40.

► Claims 1 and 36-38 recite limitations that are entirely covered by those of claim 11, and are therefore rejected by the same reason over the same prior arts.

► Especially regarding claims 36-38, 53 and 55, the conduit for conducting the gas from the source towards the ion region may be extended further beyond the inlet port, as rendered obvious by Laiko-II, showing in Fig.1 an unlabeled conduit (after the arrow denoting N₂), as recited on pg.5240/Col.2/lines 11-16. In addition, a conduit is rendered obvious by Willoughby-885, showing in Fig.5 a conduit 67 for heating the target 50 and

built proximate to it, as recited in Col.14/ll.4-16, having a purpose to deliver an alternative energy source, i.e., including a heated gas, as generally known in the art, to the target surface 50, as recited in Col.14/ll.45-50. Such a heated gas is a direct gas-to-gas contact heating explicitly recited in Applicant's claims 36-38, 53 and 55.

Although Willoughby-885's apparatus and method include other features beyond the present invention, e.g., a preceding part for introducing liquid sample to be condensed on target surface 50, those features may be simply discarded because they are not needed. The only teaching here adopted to modify Verentchikov's begins with condensed bio molecules on target surface 50, which represents, or is replaced by, Verentchikov's matrix 13. Such an omission of an element and/or its function is obvious if the function of the element is not desired/required/intended. *Ex Parte Wu*, USPQ 2031 (Bd. Pat. App. & Inter. 1989).

With regard to Willoughby-885's purpose being different than Applicant's intended use, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Furthermore, regarding the fact that Applicant's intended use is different than Willoughby-885's, a recitation of the intended use of a claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a

process of making (method claim), the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). By all means, Willoughby-885's structure is capable of performing Applicant's intended use, then it meets Applicant's claim(s). Furthermore, Applicant's claimed method does not result in a manipulative difference as compared to Willoughby-885's. So Willoughby-885 renders Applicant's apparatus and method obvious.

- ▶ Specifically regarding claim 22, to provide Laiko-II and/or Willoughby-885's heated gas, it is conventional to heat the gas source, as generally known in the art.
- ▶ Specifically regarding claims 2 and 12, Verentchikov's ion source 11c in Fig.4A, or 10 in Fig.1, is a MALDI ion source, as recited in Col.1/II.9-17, Col.2/II.19-56, Col.3/II.1-16 and Col.4/II.17-20.
- ▶ Specifically regarding claims 3 and 13, the use of fast atomic bombardment is recited by Willoughby in Col.14/II.41-42.
- ▶ Specifically regarding claims 4, 5, 8, 14, 15 and 18, Verentchikov's ion source 11c in Fig.4A, or 10 in Fig.1, is a MALDI ion source operating at atmospheric pressure (APMALDI) or an ion source operating at atmospheric pressure, as recited in Col.14/II.48-51 (claim 10), and in Col.14/II.45-47 (claim 9).
- ▶ Specifically regarding claims 6, 9, 16 and 19, Verentchikov's ion source 11c in Fig.4A, or 10 in Fig.1, operates below atmospheric pressure, as recited in Col.1/II.12-17 & Col.2/II.35-45.

- ▶ Specifically regarding claims 7, 10, 17 and 20, Verentchikov's MALDI ion source 11c in Fig.4A, or 10 in Fig.1, is inherently capable of operating above atmospheric pressure.
- ▶ Specifically regarding claim 21, Verentchikov's conduit 21 is a port, and Willoughby-885's conduit 67 is a pipe or nozzle.
- ▶ Specifically regarding claim 25, Verentchikov's conduit 21 is adjacent to the collecting capillary 40.
- ▶ Specifically regarding claims 26 and 56, Willoughby's heating gas temperature is about 100 °C, as recited in Col.14/II.31-36 in view of Col.14/II.28-31, whereas Verentchikov's temperature range is between 150 and 250 °C, as recited in the Abstract and in Col.2/II.44-47. Both specified temperature ranges overlap with the temperature range claimed by Applicant (60 and 150 °C).
- ▶ Specifically regarding claims 27 and 30, Laiko-II's heating gas is nitrogen (N₂), which is a diatomic molecule, as recited on pg.5240, column 2, lines 11-16.
- ▶ Specifically regarding claims 29-32, it is well known in the art that Laiko-II's as well as Willoughby's gas may be substituted by a monatomic, triatomic or polyatomic molecule. Suggestion and motivation for the modification of Willoughby's nitrogen gas is here based on a general knowledge of ordinary skilled in the art, and does not have to be expressly stated in the prior arts; in the present case the rationale is reasoned from knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837

F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

► Specifically regarding claim 33, the use of a coupling for joining together different parts of a vacuum apparatus is conventional, and hence, well known in the art, whereas the choice of a particular coupling design is a mere matter of design choice that only involves routine skill in the art, and hence, is obvious.

► Specifically regarding claims 34 and 35, the limitation of a housing with capillary cap and spacer disposed in it, is rendered obvious by Laiko-II, trivially showing a housing 5 shown in Fig.1, as recited on pg.5240/ll.1-10 of the Experimental Section..

16. Claims 28, and 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al. in view of Laiko-II and Willoughby-885, and further in view of Laiko et al. (IDS), hereafter denoted as Laiko-I (Anal. Chem. 2000, Vol. 72, pp.652 ff.).

Verentchikov et al. as modified by Laiko-II and Willoughby-885 recites all the limitations of claims 28 and 57-59, as previously applied to the respective parent claims 11 and 47, except the recitation of a gas flow rate of 2L/min. to 15L/min. (claim 57), an ionization volume of 1-5 mm³ (claim 28), and a distance of between 1mm to 5mm between conduit and matrix based ion source (claim 58).

Laiko-I discloses a matrix based ion source for mass spectrometry in which laser desorption is used, as recited on pg.652/lines 1-5.

Laiko-I's ionization region, located between Laiko-I's 3/4/5, capillary 2, and gas nozzle 7, as already identified previously, has an area of $(0.7-1.6 \text{ mm}^2)$, as recited by Laiko-I in the last line on pg.653/Col.1. Verentchikov's collecting aperture has a dimension of about 1mm as recited in Col.5/ll.30-35. Hence, the ionization volume is estimated to be between $1-1.6 \text{ mm}^3$, which approximately overlaps with the volume range claimed by Applicant, whereas the distance of Verentchikov's collecting capillary to the matrix ion source is estimated to be about the same order of magnitude as the diameter, or larger, i.e., $> 1\text{mm}$, which also overlaps with the distance as claimed by Applicant.

► Specifically regarding claim 57, the gas flow rate is particularly determined by the pumping capacity of the mass spectrometer, as generally known in the pertinent art. Verentchikov's pumping capacity is 300L/sec, or 5L/min., as recited in Col.5/ll.27-29, whereas Laiko-I's gas feed is about 0.4-0.8L/min., as recited on pg.653/lines 4-10. One of ordinary skill in the art may thus estimate of a gas feed flow rate of about 1-5L/min., which essentially overlaps with the gas flow rate claimed by Applicant.

► Claim 59 recites limitations that consist of a combination of claims 47 and 55-58. Therefore, claim 59 is rejected by the same reason over the same prior arts as applied previously to claims 47 and 55-58.

17. Claims 23, 24 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verentchikov et al. in view of Laiko-II and Willoughby-885, and further in view of Whitehouse et al. (USPAT # 5,962,851) and Wilson Jr. (USPAT # 5,022,379).

Verentchikov et al. as modified by Laiko-II and Willoughby-885 recites all the limitations of claims 23 and 24, as previously applied to the respective parent claim 11, except the recitation of the collecting capillary being enclosed by the conduit, at least partially.

Verentchikov's collecting capillary 40 is heated by an unspecified temperature source 19, as recited in Col.6/II.25-31. However, Verentchikov's conduit 21 does not enclose the collecting capillary 40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat ions or gas flowing along a capillary/tube by a heating-gas flowing in a conduit which encloses the ion collecting capillary, which is rendered obvious by Whitehouse et al., showing in Fig.1 a collecting capillary 4 enclosed by a conduit 23, thus forming a coaxial heat exchanger, as recited in Col.7/II.62-66.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat ions or gas flowing along a capillary/tube by a counter-propagating heat-gas flow forming a coaxial heat exchanger with counter-propagating heat-gas flow, since such coaxial heat exchanger is conventional and well known in the art, as disclosed by Wilson Jr. in the Abstract/II.5-11, Col.6/II.37-68 and Col.7/II.19-23.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 703 305 0149. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

Art Unit: 2881

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
November 6, 2003



JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800